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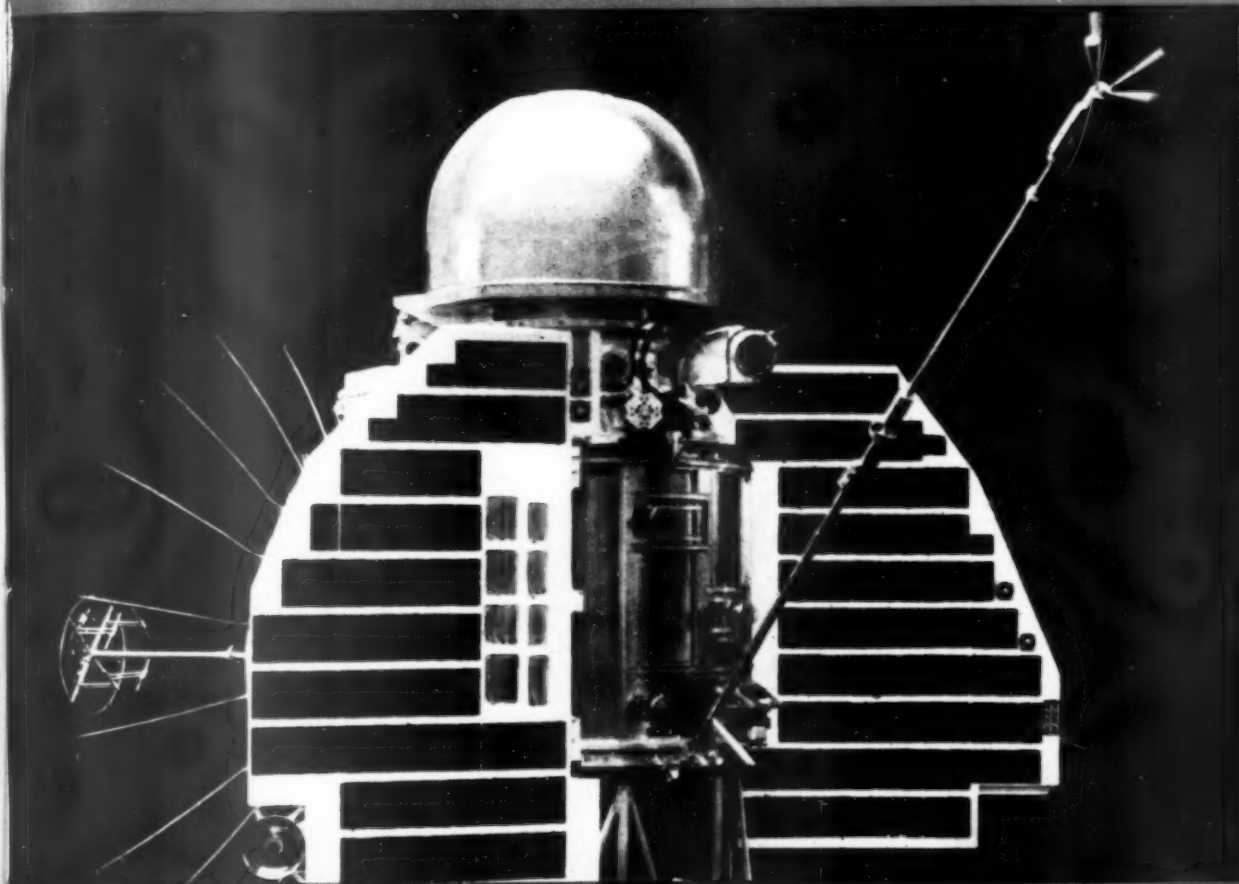
March 25, 1961

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VOL. 79, NO. 12 PAGES 177-192

# SCIENCE NEWS LETTER



THE WEEKLY SUMMARY OF CURRENT SCIENCE



Venus Vehicle

See Page 187

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## SURGERY

# Cut-Off Liver Kept Alive

► POSSIBLE HOPE for patients with advanced and inoperable cancer in the liver is foreseen as a result of animal experiments.

Three surgeons have completely isolated the liver from dogs, and with heart-lung machines have kept the animals and their livers alive for as long as eight hours. They were able to replant the livers in place, rejoin the numerous blood vessel connections and restore the animals to health.

The American Cancer Society, which helped support the research, reported that Drs. William V. McDermott Jr., Paul J. Kestens and W. Gerald Austen of the Harvard Medical School and Massachusetts General Hospital, Boston, had successfully cut off and perfused the animal livers.

The purpose of the experiments was to

determine whether it might be feasible to perform a much simpler operation—perfusion of the liver without removing it—on human beings.

Without physically removing the liver, the organ might be cut off from the rest of the body and blood loaded with anti-cancer drugs could be pumped through the isolated liver without exposing the rest of the system to the toxic effects of the medication, the Society said.

The operation requires ultramodern surgical facilities and highly specialized surgical skills. The feasibility of ultimate application to cancer of the liver in man will depend on continued work in medical centers.

• Science News Letter, 79:178 March 25, 1961

## MEDICINE

# Skin Grafts and Cancer

► HUMAN SKIN and baby pig skin have been successfully grafted on volunteer cancer patients.

Success of the grafts may be associated with an immunological defect similar to an immunological defect assumed to be responsible for cancer growth, researchers at the Sloan-Kettering Institute for Cancer Research in New York reported. This is because tissue grafts from other human beings or from other species will usually not grow in healthy individuals.

"The search for immunological responses to cancer," Dr. Frank L. Horsfall Jr., president and director of the Institute, said in a progress report, "requires that one assume that cancer is in some sense a tissue foreign to its host."

The grafting studies are very preliminary but suggest that a new era of lifesaving surgery might possibly result if the immunological barriers could be defined and lowered to permit the transplantation of whole organs.

In some instances, an immunological

response against cancer may exist, the Institute reported.

Pathologists of the Memorial Sloan-Kettering Cancer Center reported a study of women with breast cancer, some of whom died within three years after surgery, and some of whom were cured.

They said the only difference found in a large proportion of the cured group was a marked inflammatory response with white cells forming a border around the edges of the cancer. This response appeared identical to that seen previously in a study of healthy individuals who rejected implants of cancer cells.

Other investigations reported underway include studies of ways in which the diseased bone marrow of leukemic children can be replaced with healthy bone marrow. Exploration is being made of various chemicals, such as nitrogen mustard and 6-mercaptopurine, that may both destroy the leukemic cells and depress the immunologic responses to an extent making grafts of healthy marrow possible.

• Science News Letter, 79:178 March 25, 1961

## AEROMEDICINE

# Medicine's Role in Space

► AIR FORCE aerospace medical research is looking ahead ten years to having man in space part of the military defense system, Gen. Oliver K. Niess, Surgeon General of the Air Force, has reported.

But the immediate responsibility is "to support in every way we can" Project Mercury, the man-in-space program of the National Aeronautics and Space Administration, he emphasized.

The Air Force medical service commanded by Gen. Niess has played a major role in the national space effort of the civilian agency. Its experts participated in

the selection of the Mercury astronauts, their testing, conditioning, training, and have participated in the development of the recovery program so vital to man's first launch into space. Its veterinarians are responsible for the training and preparation for the Project Mercury animal launches.

Future Mercury shots still have top priority in the Air Force space medicine program, as will any national space effort that needs our support, Gen. Niess said.

In order to be able to move more swiftly in its vital space research, the Surgeon General announced that he has coordinated all

medical research under his direct command. "This will avoid duplication and subsequent waste," he explained.

• Science News Letter, 79:178 March 25, 1961

## ROCKETS AND MISSILES

# Solid-Fuel Blue Scout Scores 100% in Space

► THE SOLID-FUEL Blue Scout, the Air Force "economy rocket," scored 100% in its space test, the Air Force Research and Development Command reported in Washington.

Primary objective was to test its propulsion and guidance systems for carrying a 172-pound scientific payload to an altitude of 1,500 nautical miles. No recovery of payload was planned, information was telemetered as scheduled.

The Blue Scout surpassed its primary goal by zooming to 1,580 nautical miles in the planned path, which passed through the lower edges of the lower Van Allen belt in order to obtain detailed radiation measurements. Proton, electron, neutron and gamma fluxes and energies were measured as well as radiation effects from energy passing through simulated human tissue.

The telemetered data on radiation will be reduced and evaluated within two or three weeks, SCIENCE SERVICE was told. Radiation data of this kind help to determine the hazards to which man may be exposed even in sub-orbital flight.

Maximum velocity of the Blue Scout was more than 20,000 feet per second or about four miles per second.

• Science News Letter, 79:178 March 25, 1961

## ROCKETS AND MISSILES

# Many Failures in Space Caused by Human Error

► FAILURES in missile weapons and space systems are from 20% to 53% due to human factors, a study conducted at Stanford Research Institute on seven missile systems showed.

The study also showed that 23% of all unscheduled missile holds were human-initiated.

One disastrous launch or flight failure was human-initiated, Joel Cooper, Lynn Rigby and William Spickard of the human engineering branch of Northrop Corporation, Hawthorne, Calif., reported to the American Rocket Society meeting in Los Angeles.

Information on human-initiated failures in a missile or space system is not now adequate enough for the human factors specialist.

This is because reporting systems tend to show malfunctioning of equipment, not men, the Northrop human factors experts found. Persons involved in the failures are reluctant to give information concerning either themselves or their co-workers.

Their conclusions were upheld by a comparison of written and verbal reports obtained from test personnel.

• Science News Letter, 79:178 March 25, 1961

## ROCKETS AND MISSILES

# Probe Magnetism in Space

A U. S. interplanetary probe will carry out two experiments for the first time in the interest of manned space flight. The total magnetic field and solar wind will be measured.

► THE UNITED STATES will soon launch an interplanetary space probe carrying a new device able to measure the total magnetic field, never done before in deep space.

The second major purpose of the probe is an experiment to measure the solar wind, the first attempt of its kind. The solar wind experiment is conducted by Massachusetts Institute of Technology.

The probe, P-14, is designed to find out more about the environment in space in the interest of safer manned space flight, the National Aeronautics and Space Administration reported in Washington, D. C.

The P-14, a magnetic field-solar radiation probe, will travel 140,000 statute miles into space to investigate magnetic fields and solar radiation and their interaction with each other in interplanetary space. Both magnetic fields and radiation are believed to constitute hazards to man's survival in space.

A three-stage Thor-Delta rocket will be used to launch the probe that will carry a very sensitive device, a rubidium vapor magnetometer.

This magnetometer can measure the total magnetic field instead of merely the two

components, vertical and horizontal, previously measured.

The rubidium vapor magnetometer is considerably more sensitive and accurate than any flown before, NASA said.

The probe is also expected to aid scientists in designing communications satellites.

• Science News Letter, 79:179 March 25, 1961

## ROCKETS AND MISSILES

## Space Capsule Loop Helps Ocean Rescue

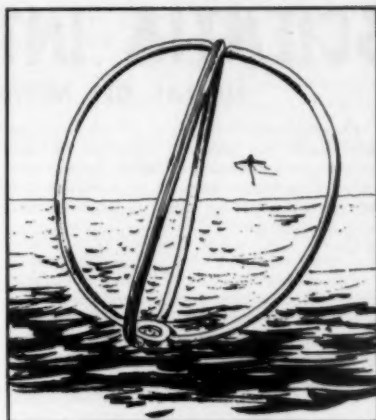
► INSTRUMENTED payloads splashing into an ocean from outer space in the future will have giant protruding loops which can be hooked onto by a retrieving airplane.

This latest convenience in space exploration was reported to the American Rocket Society meeting in Los Angeles by two U. S. Navy engineers, Royal C. Schendel and Frank J. Brennan.

The loops are part of an 11-pound rescue package that makes possible easy retrieval of space capsules weighing from 50 to 300 pounds.

The package will be carried in the nose cone, and will make contact with a coupling package attached to the centerline bomb rack of a tactical aircraft.

The retrieval unit on the capsule of metalized Mylar construction can be lo-



SPACE CAPSULE LOOP

cated easily by radar and visual sighting. It is looped around the capsule with nylon straps. The package has two 12-foot high circular loops for an easy pick-up by an aircraft-borne "flying hook" and a 50-foot length of undrawn nylon rope connecting the hook to the aircraft.

When in operation, this equipment will eliminate the need for range ships spotted over the dispersion area, the Navy engineers predicted; and pick-up can be achieved in a matter of minutes.

The equipment is so simple to handle that the retrieval can be accomplished by any naval aviator who has had even brief experience flying a recovery test. Expertly trained crews will not be needed.

The method of air-sea retrieval has another advantage in that it can be used any time that it is desired to transfer data or material from ship to shore swiftly and easily.

• Science News Letter, 79:179 March 25, 1961

## ROCKETS AND MISSILES

## Dummy to Ride in Space

► ANOTHER SPACE SHOT is scheduled before an astronaut takes a leap into space. It will be an unmanned Mercury-Redstone rocket that will not go into orbit.

The success of the next trial with a dummy payload may mean a Mercury astronaut then will take a sub-orbital ride. At this time, manned orbital flight is anticipated "before the year is out," Dr. Abe Silverstein, director of space flight programs for the National Aeronautics and Space Administration, told a Congressional committee.

An accurate timetable for manned space flight is not possible yet because of "the tremendous complications of the overall system," Dr. Silverstein explained to the House Committee on Science and Astronautics.

One of these complications is the Mercury spacecraft escape system scheduled for another test. The system consists of a Little Joe 60,000-pound, solid-propellant

rocket on top of the upper neck of the spacecraft.

An electronic brain built into the Redstone launch vehicle can sense impending malfunctions and trigger the escape system automatically. The escape device in Mercury is designed to carry both craft and pilot safely clear of a faltering launch vehicle.

This will be the sixth test of the Little Joe. Four of the previous tests were successful. Little Joe V did not fulfill all test objectives. The purpose of the test was to qualify the system during and after an escape maneuver under the most severe conditions anticipated during an Atlas launch for orbital flight. The escape rocket ignited but the craft and entire escape system did not separate from the Little Joe V.

If Little Joe VI is successful, then manned orbital flight scheduled for this year is more likely to be achieved.

• Science News Letter, 79:179 March 25, 1961



**OUTER SPACE RADAR**—In a space radar for orbiting satellites the light from an optical maser (top) pulses out to a distant target and is reflected and collected by mirror in telescope (below). Hughes Aircraft Company, Culver City, Calif., developed the device.

# SCIENTIA INTERNATIONAL

## NOVAS DEL MENSE IN INTERLINGUA

**Demographia.**—Secundo le plus recente censo del Statos Unite, il existe in iste pais quatro citates con un population de zero personas. Duo altere citates ha un habitante cata un. Il etiam existe un citate con duo residentes. Istos es curiositates del lege. Le mentionate localitates esseva abandonate per lor habitantes pro varie rationes e a varie periodos del passato, e le competente legislaturas del statos concernite ha simplemente non ancora prendite (o trovate) le occasion de abolir los formalmente.

**Linguistica.**—Le Tertié Congresso Mundial de Psychiatria, Montreal, junio 1961, se servira de interlingua in su programma official. Le congresso admittit discursos in quatro linguas national. Le summarios del discursos va esser publicate in (1) le lingua usate per le contribuentes individual e (2) in interlingua. Le total del discursos es circa 400. Le summario individual ha un longor de inter 200 e 300 parolas.

**Recercas de Cancere.**—Pathologos al Centro Memorial Sloan-Kettering de Cancerologia ha trovate un importante phenomeno que distingue fem'as curate ab cancro mammari per le intervention chirurgic ab illas morte intra tres annos post le operation. In le curatas il habeva un marcate responsa inflammatori con congregationes de leucocytes formante un margine circum le foco cancerose. Iste reaction mancava in le non-curatas. Le mesme typo de reaction ha previevemente essite notate in subjectos normal post le implantation de cancro experimental que es "rejetite" per le "mechanismos de defensa" del corpore.

**Geologia.**—In martio e april 1961, forationes submarin in le vicinitate de Guadalupe in le Oceano Pacific marca—preliminarmente—le initiation del phase practic del si-appellate "Projecto Mohole". Le ultime objectivo de iste enorme projecto de recerca geologic es penetrar in le mantello del terra que jace infra le crusta e que ha nunquam—usque nunc—essite examinate directemente. Le termino "Mohole"—contine le parola angese pro "perforation"—es derivate ab le nomine del yugoslav geologo Mohorovicic qui es le discoveritor del discontinuitate inter le crusta e le mantello del terra.

**Navigation.**—In octo annos de viages de observation—coperiente un distantia total de 90.000 millias—le schooner Zarja del flotta russe (con su tres masts e su corpore de ligno) ha colligite le massa de datos que es currentemente usate a Moscova e Leningrad in le preparation de nove e plus exacte mappas magnetic del Oceanos Indian e Atlantic. Le viages del Zarja va ultimemente haber effectos benefic pro le navigation de omne le nationes del mundo.

**Pollution Marin.**—Al costas del Statos Unite, grande avarias es suffrite per le psicheria e le industria balneari, e milles e milles de aves marin mori omne anno in consequentia del pollution del aquas costal que resulta del costume de naves-tank de omne nationes de discargar lor inusabile residuos de oleo ad in le oceano a inadequate distantias ab le portos. In 1954, dece-tres nationes—non incluse le Statos Unite—concludeva un accordo que autorizava omne le nationes participante de prohibir le discargar de residuos de oleo intra 50 millias ab le costa e mesmo de allargar le zona protegite usque a 100 millias ab le costa in casos special, tal como—per exemplo—le caso de Anglaterra que esse exposite a currentes oceanic con un forte tendentia de re-entrata verso le plagas. Importante segmentos del population american non comprende pro qual ration le Statos Unite non se adhere al supra-mentionate accordo.

**Hypnotismo.**—Le Association American de Psychiatria nota con alarma le maniera in que le practica del hypnotismo se extende in le dominio del therapia dental e medical. Le Association non se oppone per principio contra le utilisation therapeutic del technicas del hypnotismo, sed illo insiste que le dentista o le medico qui ha apprendite a hypnotisar un subjecto human deveni un mal-practicante si ille hypnotisa su patientes sin comprender etiam le limitationes e le grave riscos del methodo. Le rolo del hypnotismo in le practica medical e dental es un thema de studios academic e excede le competentia del laicos qui in nostre dies se offre commercialmente como instructores in iste campo.

**Recercas Veterinari.**—Le Statounitese Departamento de Agricultura e le Universitate Estatal de Kansas es urgentemente interessate a comprar pares de geminos bovin identic. Geminos identic es disveloppate ab un sol ovo. In un certe senso illos es un sol individuo con duo corpores. Isto explica que illos ha un importantissime rolo in varie generes de recerca comparative. In le racia human, geminos identic es paucio frequente. In le racia bovin, illos es extrememente rar.

**Recercas de Cancere.**—Le analyse statistic del casos de cancro mammari tractate al Hospital Pennsylvania in Philadelphia ha revelate le sequente factos: Le absolute superviventia quinquenne amonta a 36 pro cento. Le percentage de curationes pro patientes tractate per chirurgia radical amonta a 34. Le casuistica al base de iste cifras coperi 30 annos. Pro le 229 casos tractate in le curso del passate decennio le superviventia quinquenne total es 41 pro cento, post chirurgia radical 49 pro cento. Si le casos con tumescencia del fossa axillar o con nodos axillar es excludite, le curationes amonta a 51 pro cento. Se le casos con le mentionate complicationes es includite, le curationes amonta a 24 pro cento. Le casuistica de iste studio include 21 casos de cancro in ambe mammas.

**Geriatrica.**—Medicos del statounitese Administration de Veteranos ha examinate 134 veteranos del Guerra Hispano-Americana in le grupos de etate de inter 72 e 92 annos, como parte de un studio general que visa a establir normas de tendentias physiologic e pathologic a varie stadios del invetulation. Le 134 ancianos ha producite plure surprisas. Secundo un "benfundate prejudicio", illes deberea haber como habito typic le statura de Lincoln. De facto, lor apparentia es plus totio illo de Churchill o Hoover. Nulle del 134 ha disveloppate cancro pulmonar, ben que 25 de illes continua esser forte fumatores e 51 lo esseva in le passato. Secundo le regula general, homines de iste typo de statura tende a morir durante le quinte e sexte decennio de lor vita, principalmente ab disordines cardiac coronari. Le presente 134 veteranos ha refusate obedir a ille regula general.

**Technologia Nucleari.**—Esseva patentate un systema de "telemanipulation" pro le travallo con materias radioactive intra solidemente claudite cameras armate. Le "telemanipulator" require nulle porta de entrata sed responde a comandas magnetic.

**Meteorologia.**—Nulle representante russe ha apparite al congresso Washington del Organisation Mundial de Meteorologia. Isto esseva notate con regret, specialmente in vista del excellent clima de cooperation international establite con le russos durante de anno geophysic.

• Science News Letter, 79:180 March 25, 1961

## GENERAL SCIENCE

### Reading Interlingua

➤ YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you have never had contact with any foreign language.

Twenty-three medical journals regularly publish in Interlingua abstracts of their original papers.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N.Y.

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## MEDICINE

# Periwinkle Drug for Cancer

► **CANCER** now can be attacked by means of a drug extracted from the blue-flowered periwinkle, a trailing evergreen herb, Eli Lilly and Company has reported.

The pharmaceutical company cautioned, however, that the effectiveness of the drug is limited now to treatment of only two types of cancer, generalized Hodgkin's disease and a rare type of malignancy known as choriocarcinoma.

An alkaloid extracted from the periwinkle, known as the sulfate salt of Vinblastine (VLB), the new drug is being introduced under the trademark Velban. It is available only on prescription and is administered by the physician by intravenous injection.

VLB has been used at the National Cancer Institute, Bethesda, Md., in treating choriocarcinoma, a tumor of a membrane found in the placenta, ovaries and testes. This type of cancer represents only a very small percentage of all cancer cases, with only 700 reported in the United States.

Remission of the disease in patients treated at the National Cancer Institute occurred for periods as long as one year. And in two out of 14 cases where the VLB was used, the remission still continues.

However, it is against Hodgkin's disease that the drug has proved most effective. Several patients have lost, at least for the present, all evidence of Hodgkin's disease. In more than half the patients treated, the drug was successful in reducing at least by 75% the tumor masses.

In many of these cases, the patients had failed to respond to other methods of treatment.

Although the clinical trials have proved most encouraging, there is no evidence that in any instance Velban has "cured" Hodgkin's disease or any other form of human cancer. No cancer is said to be possibly cured until there has been complete remission for at least five years.

VLB has thus far been studied in 300 patients having a variety of malignant diseases. Evaluation of results in cancers other than Hodgkin's disease and choriocarcinoma have not been completed.

The activity of periwinkle extracts against cancers in animals was discovered independently by scientists of the Collip Research Laboratories at the University of Western Ontario, London, Canada, and of the Lilly Research Laboratories.

• Science News Letter, 79:181 March 25, 1961

## MEDICINE

# Diet Controls Diabetes

► **AT LEAST** 40% of diabetics are overweight and in them the disease can be controlled by diet alone.

"Too many physicians are treating diabetics by having them swallow only a

couple of tablets daily without proper diabetic management," Dr. Leonard H. Hamff, Emory University, Atlanta, stated.

The new drugs, tolbutamide and chlorpropamide, Dr. Hamff said, have stimulated

research in diabetes, but study should be continued to discover their mechanism.

Juveniles should not be given these new drugs, known as sulfonylureas, because diabetic acidosis may develop, Dr. Hamff said.

"The sulfonylurea drugs are not a substitute for insulin," he explained.

Dr. Sidney A. Tyroler, Georgetown University, Washington, said insulin is still required in a great many diabetics despite the inroads made by oral drugs used to treat hypoglycemia, a condition in which the concentration of glucose in the blood is below normal.

Insulin reactions, he said, are commonly caused by three things: too little food intake for the accompanying insulin, too much exercise or too much insulin.

"The Sunday athlete may have a severe reaction after mowing his lawn," Dr. Tyroler said. Or the patient may skip a meal because he is too busy, has no appetite or is unable to eat because of vomiting. Hypoglycemia, due to an overdose of insulin, usually occurs from one to 36 hours after administration, depending on the type of insulin used.

However, few deaths have ever resulted from taking too much insulin. Most of those resulting from insulin overdosage have occurred when a mistaken diagnosis of acidosis was made in a patient with hypoglycemia, or who was in a post-hypoglycemic state and received further insulin, Dr. Tyroler said.

The insulin compensating mechanism of the body is so effective that even massive dosages, such as taken for suicidal attempts, fail to kill.

The diabetes seminar was held at Georgetown University Medical Center, Washington, D. C., for physicians from a four-state area and the District of Columbia.

• Science News Letter, 79:181 March 25, 1961

## MEDICINE

# Food for Queen Bees Saves Leukemic Mice

► **ROYAL JELLY**, the food that transforms an ordinary bee into a queen, can be a lifesaver for mice with leukemia. But if the dose is too large or too small, it is deadly stuff for the mice.

Drs. B. Grad, V. A. Kral and J. Berenson of McGill University, Montreal, Canada, report that one-fiftieth of a teaspoonful of royal jelly prolongs the lives of leukemic mice if it is injected once a week. If given daily, however, it shortens their life span.

One five-thousandth of a teaspoonful of the jelly also protected young mice from freezing if injected before and during exposure. Higher and lower doses, again, had no effect in this case.

Relatively large doses of royal jelly are definitely poison for mice, the researchers report in the Canadian Journal of Biochemistry and Physiology, 39:461, 1961. A fifth of a teaspoonful of this substance, sometimes used as an ingredient in cosmetics, kills more than half the mice within two days.

• Science News Letter, 79:181 March 25, 1961



**SYNTHETIC CAR**—Developed by General Motors Research Laboratories to study interaction of driver and vehicle controls, this analogue driving simulator gives the illusion of turns in the road, and the driver steers to follow.

## NATURAL RESOURCES

# Saving Natural Resources

► **IMPORTANT** natural resources should not be destroyed under the "new starts" being made by the Kennedy Administration, a top wildlife expert charged.

Federal agencies have a long way to go before they begin to pull together to preserve the nation's legacy of abundant natural resources, Ira N. Gabrielson, president of the Wildlife Management Institute, said. He praised President Kennedy's evaluation of the nation's resources situation at the opening session of the 26th North American Wildlife and Natural Resources Conference in Washington, D. C.

Mr. Gabrielson said that taking the water pollution problem "out of the fifth sub-basement" of the Health, Education, and Welfare Department is a step in the right direction. But Federal agencies still have many disputes to settle.

The Bureau of Land Management, he said, is "dominated—and frustrated—by one small group of resource users," the cattle owners who graze their herds on some of the 475,000,000 acres under BLM administration for 22¢ per cow per month while hunting, fishing, mining and lumbering are kept at a minimum.

Mr. Gabrielson also noted that there is something of a running feud between the Departments of Interior and Agriculture. Agriculture, he said, destroys the wetlands breeding grounds of waterfowl faster than Interior can buy up new grounds with funds from duck stamp purchases.

Agriculture continues to spray toxic chemicals in pest-plagued areas while Interior tries to keep birds and wild mammals in the same area from being poisoned. Millions are spent for the chemicals, but neither department has enough funds for

their research departments to find out how dangerous the chemicals are.

The State Department also is involved, Mr. Gabrielson said, because the United States promised Mexico and Canada that conservation efforts will be maintained for migratory species.

Departments and agencies need money, Mr. Gabrielson concluded, but they also need coordination.

• Science News Letter, 79:182 March 25, 1961

## Bird Birth Control

► **THE BIRDS** that cause plane crashes over airports may be eliminated with a birth-control chemical once rejected for human use by the Planned Parenthood Association.

The chemical, triethylenemelamine (TEM) interferes with the formation of gametes, or reproductive cells, in both male and female blackbirds. It works just as well on starlings, the bane of the runways.

Dr. David E. Davis of the Pennsylvania State University, University Park, has found that in birds eating corn mixed with TEM, no useful reproductive cells are formed for two months.

At the 26th North American Wildlife and Natural Resources Conference meeting in Washington, D. C., Dr. Davis said that if the birds could be induced to eat the treated corn for only three or four days at the right time of year, they would be "out of the running" during the entire breeding season, and thus for the whole year, until the next breeding season.

In the first field trials, TEM reduced blackbird fertility by about 20%, meaning

that 20% fewer young were hatched than normal.

About six years ago, TEM was being considered as a birth-control chemical for human use. It halted production of human sperm and ova well enough, but it also damaged human blood cells. In rats, blackbirds and starlings; however, it seems to have no harmful effects on blood cells.

The real problem, Dr. Davis said, is not finding an effective gametocide, as TEM is called, but working out the mechanics of its use. The chemical can cut down reproduction rates in the rare whooping crane as easily as in the pesky starling.

Part of Dr. Davis' work was done under contract to the U.S. Fish and Wildlife Service, the agency charged with finding some way of keeping birds away from airports. The bird birth-control chemical might be used, Dr. Davis said, as one phase of a many-sided plan. It could be used without endangering other birds if treated feed were placed in winter roosting quarters frequented only by the blackbirds or starlings.

• Science News Letter, 79:182 March 25, 1961

## PHYSIOLOGY

## Sensitive Thermometer Probes Nerve Chemistry

► **THE CHEMISTRY** of nerves and muscles is being studied with the help of a tiny thermometer that measures temperature changes in millionths of a degree.

Bernard C. Abbott of the University of California, Los Angeles, zoology department is seeking to learn more about the chemical reactions that make possible nerve and muscle impulse transmission by measuring heat production of such reactions in nerve cells.

These infinitesimal temperature variations, plotted during a fiftieth of a second, give some indication of the sequence of chemical events occurring during nervous activity. This activity includes a complete cycle, from initiation of the nerve impulse to the nerve cell's complete recovery and return to readiness for future activity.

"Cracked crab" is the subject of part of the investigation. Spider crab legs are cracked, and the leg nerve is removed for study.

Nerve cells from the electricity-producing organs of the torpedo ray are also being investigated. The cells are electrically stimulated and heat measurements made during transmission of impulses.

Rapid movement of charged particles (ions) of sodium and potassium across the nerve cell membrane occurs during an impulse.

Sodium ions rush into the cell from extracellular space, and potassium ions stream out during particular phases of transmission.

The heat of this exchange reaction appears to constitute about half of the total heat produced in the initial period of cell stimulation.

From such studies a better knowledge of the basic chemistry of nerve and muscle action is evolving.

• Science News Letter, 79:182 March 25, 1961

## NATURAL RESOURCES

# Water Pollution Check

► **A NATIONAL** water resource program supported fully by all levels of Government and other organizations must be developed to combat water pollution.

Until State and Federal governments take a more active role in controlling water pollution, the objectives of a national water pollution control program cannot be met, the Public Health Service Water Pollution Control Advisory Board has concluded.

Although states have primary responsibility for water pollution control, their programs, with few exceptions, are entirely inadequate, the Board charged. State agencies must be provided with adequate funds and given more power to carry out their programs.

The Board recommended a crash program in Federal aid that includes construction of city waste-treatment plants and research laboratories, and grants for state and interstate water pollution agencies.

The Board met in Washington, D. C., to review the findings of the Senate Select Committee on National Water Resources. Although the Senate study covered a much greater scope in water planning, the Board emphasized that the pollution control program must be given the highest priority in water resources developments.

Water pollution control is an integral part of the national water problem, and "water quantity requirements can be met . . . only if water quality is maintained," the Board reported to the Surgeon General of the Public Health Service.

The advisory group agreed with the major recommendations of the Senate Select Committee. The Board especially emphasized the Senate recommendation of a ten-year Federal program to states for water resources planning.

• Science News Letter, 79:182 March 25, 1961

## EDUCATION

## Peace Corps Set Up

► A DOZEN nations already have inquired about the Peace Corps, Sargent Shriver, chairman-designate of the newly established Peace Corps Agency, reported in Washington, D. C.

Minimum age for volunteers will be 18, but "there will be no upper limit," Mr. Shriver said. He doubted, however, that there would be many volunteers selected beyond 60 years of age because of the "practical limits" imposed by rigors of service.

Volunteers will be expected to serve at least one year. A service requirement will be that the volunteer live at the level of those in the country he will assist.

"This means that a Peace Corps teacher will be expected to live at the level of a native teacher of the country to which he has been assigned," Mr. Shriver explained.

The Corps will give a new dimension to American education—in our tradition of learning by doing. Volunteers "will probably learn even more than they teach," he predicted.

Inquiries about the Peace Corps are pouring in. Since the announcement by President Kennedy that the Agency was officially established, there have been from 3,500 to 4,000 letters of inquiry daily.

Training will be done at various universities and colleges throughout the country, with persons from the countries that will be served participating in instruction. Instruction of selectees is expected to take place from June to the middle of September.

This instruction will include such basic courses as studies on American democratic institutions, the customs and history of the country for which preparation is being made, and an intensified crash course on language requiring three to four hours of study and practice daily.

Programs of instruction will be under the direction of Dr. A. Sims, president of the Institute for International Education. He discussed proposed instruction with the Universities of Notre Dame, Stanford, Cornell and Michigan.

One aim of the Peace Corps will be to emphasize the great value and need for vocational skills and "give the farmer, the carpenter, the bricklayer and plumber a chance at international service as official representatives of the United States," Dr. Thomas Quimby of Michigan, in charge of recruitment, said.

The Corps presently is aimed at aiding in satisfying the most basic needs of those countries most in need, he emphasized.

The hope is that 500 to 1,000 trained Peace Corps volunteers will be in the field before the end of 1961, Mr. Shriver said.

They will work through existing international private service groups as well as through agencies of Government, universities and colleges, the United Nations and special agencies abroad, and under direct "government-to-government" relationships, he said.

• Science News Letter, 79:183 March 25, 1961

## ASTRONOMY

## Star's Mistaken Identity

► A STAR suffering from a case of mistaken identity is being investigated by astronomers.

The star, classified as a very hot blue star, has proved to be of a much "cooler" variety with a peculiar spectrum of unknown type.

This was discovered when the star was observed spectrographically at Mt. Stromlo Observatory, Canberra, Australia. The spectral type of the star indicated from these studies, later confirmed by three-color photometry done by J. B. Whiteoak, is of a much "cooler" orange-yellow type star.

The star's spectrum shows strong hydrogen lines corresponding to yellow and yellow-white stars. Six-color photometry by Dr. G. E. Kron indicates it is not a double star.

Instead it has the characteristics of a dwarf star with a higher abundance of metals in its atmosphere than dwarf stars ordinarily have. Dr. Antoni Przybylski of Mt. Stromlo reports in *Nature*, 189:739, 1961, that he expects metallic elements to be many times higher than normally found.

The star is known to astronomers as HD 101065. It is located in the constellation of Centaurus, the centaur, which is

visible from the Southern Hemisphere. Dr. Przybylski said its spectral lines showing what elements are present, indicate the star is very rich in barium, strontium and rare earths. This confirms that the star is in a late state of stellar evolution and has passed through the stages in which heavy elements build up by capturing slow neutrons.

• Science News Letter, 79:183 March 25, 1961

## SEISMOLOGY

## Earth's Core Probed by Earthquake Vibrations

► EARTHQUAKE VIBRATIONS deep within the earth are telling scientists more about the earth's interior.

Studies of the earth's vibrations triggered by the Chilean earthquake, May 22, 1960, may have confirmed what scientists had previously believed about the earth's interior—that it has a solid inner core surrounded by an elastic outer core.

Sensitive seismic instruments detecting the earthquake unexpectedly recorded free vibrations of the earth's inner core. This was registered as a high energy level that

persisted for one and a half hours on a gravimeter, geophysicist Dr. Louis B. Slichter of the University of California at Los Angeles reported in the Proceedings of the National Academy of Sciences.

The UCLA scientist believes that the reading probably indicates a solid inner core encased in an elastic shell. A core that reacts like a solid yet has an "elastic bounce" when seismic waves pass through would give a high energy reading, the scientist theorized.

The amplitude of the core's vibration was about 19 inches. The inner core vibrates for the same reason that a piano string vibrates when a piano key is struck.

Some seismic waves set off by an earthquake shoot toward the earth's center striking the inner core and causing it to vibrate.

The Chile earthquake provided the first fully convincing observational evidence of the free vibrations of the earth, Dr. Slichter said. The earthquake was one of the severest recorded in many years. Tremendous energies released provided the strength needed to vibrate the earth's core.

• Science News Letter, 79:183 March 25, 1961

## GEOPHYSICS

## Core Drill Probes Two Miles Into Ice

► A CORE DRILL that can probe more than two miles into polar ice caps actually melts its way through 12,000 feet of glacial



### DRILL PROBES TWO MILES

ice. It was built by Pollak and Skan, Inc., Chicago, for the U.S. Army Corps of Engineers.

The Corps is using the drill to obtain ice cores for military and scientific study as a follow-up to the International Geophysical Year.

Until the thermal drill was developed, mechanical drilling methods limited ice coring to a depth of 1,300 feet.

• Science News Letter, 79:183 March 25, 1961



## ASTRONOMY

## New Observations Made Of Fastest Solar Flares

► NEW OPTICAL observations have been made of explosive solar flares, the fastest moving things on the sun.

Dr. Lewis Larmore, solar physicist of Lockheed Aircraft Corporation, Burbank, Calif., said he and his colleague Gail Moreton observed the flares and their resulting shock waves with a hydrogen alpha heliograph, an instrument that photographs in light emitted by hydrogen.

Dr. Larmore told a National Science Foundation colloquium in Washington, D. C., that they had observed that the shock waves disturbed the solar atmosphere over large areas. The shock waves also influence solar prominences. (Solar flares are intense flashes of light on the surface of the sun, lasting from one half hour to about three hours. Solar prominences are huge loops of solar gas shooting millions of miles into space from the sun.)

Dr. Larmore said the explosive flares rise more rapidly than other flares and have a considerable effect on the atmosphere of the sun. The explosive flares are also associated with the type-3 radio bursts from the sun, radio waves emitted from the sun.

Solar flares emit protons and ultraviolet rays that often interfere with radio communication on earth, Dr. Larmore said.

• Science News Letter, 79:184 March 25, 1961

## ASTRONAUTICS

## Space Cooperation Must Be Reciprocal, JFK Says

► COOPERATION in space between the Soviet Union and the United States must be based on reciprocity, President John F. Kennedy said in Washington, D. C.

Despite continued attempts to reach such agreement, none yet has been achieved, he said.

The President emphasized that any such agreement must present no threat to national security and "contribute to some useful purpose."

Asked by SCIENCE SERVICE if there had been a definition of special areas for space exploration in which cooperation with the Soviet Union would not affect national security, the President said, "There are other proposals we have made for the long-range explorations of space, weather control, and so on; and we are going to continue to attempt to engage the Soviet Union in a common effort of that kind of activity."

President Kennedy called attention to the fact that the Soviet representative did not attend an international meeting in Washington recently. The absence of a Soviet meteorologist "was a source of regret," he said.

In past years, the USSR has cooperated with the United States and the World Meteorological Organization in weather studies. Russian cooperation in this area reached an all-time high during the Inter-

national Geophysical Year when there was an active exchange of meteorologists between the U. S. and the USSR in important Antarctic weather research.

Some observers have attributed the absence of a Soviet scientist to the WMO meeting in Washington to political propaganda considerations. The U. S., through its weather satellites, has a definite lead in meteorological research, and it may be that the Russians are reluctant to participate in a scientific exchange where they cannot be in the limelight.

• Science News Letter, 79:184 March 25, 1961

## PUBLIC HEALTH

## Detergents for Hair Not Advised by AMA

► DETERGENTS are for heavy cleaning duty and not for the hair and scalp.

Dr. Joseph B. Jerome of the American Medical Association's committee on cosmetics states in the Journal of the AMA, 175:933, 1961, that possible damage to eyes as well as to the hair and scalp must be considered.

Replying to a question by a Connecticut physician, who asked about a specific detergent being used by mothers to wash their children's hair, Dr. Jerome said a large number of available shampoos are more bland and to be preferred on that account.

Commercial detergent products, he said, are "usually marketed in a number of formulations because adjustments in the basic formula may be necessary due to variations in the relative hardness of the water in the marketing area."

The AMA consultant added that a further complication arises from the fact that during a period of years, the product name remains the same because of the heavy advertising investment associated with it, but there may be changes in the nature of the active ingredient used.

• Science News Letter, 79:184 March 25, 1961

## ASTRONOMY

## Exploding Star Releases Tremendous Energies

► A SUDDEN explosion of a star releases more energy than the total energy output of the sun in 100,000 years.

One such nova was observed by Russian scientists. The star flared up for a few weeks, releasing tremendous energies, and then became quiet again.

During the flare-up, the star's outer layers were hurled spaceward at speeds up to 1,100 miles per second. The brilliant light of the star's energy was recorded by Soviet instruments.

The new star, Nova Hercules, is at a distance 500 million times farther than the sun. The flare-up actually happened about 4,000 years ago, but light from the nova is just now reaching the earth.

The Russian studies were conducted at the Crimean Astrophysical Observatory by Dr. V. B. Nikonov and reported in translation by the U. S. Joint Publications Research Service in Washington, D. C.

• Science News Letter, 79:184 March 25, 1961

# IN SCIENCE

## EDUCATION

## College Teaching Seen in New Light

► MORE COLLEGE graduates are turning to college teaching as a "prestige" career despite opportunities to earn more money in other fields. Dr. Hans Rosenhaupt, national director of the Woodrow Wilson National Fellowship Foundation, Princeton, N. J., noted in a survey of this year's scholarship winners.

Dr. Rosenhaupt also said that more students of outstanding ability are being recruited from hundreds of colleges, indicating the high quality of education in many lesser known schools. Fellowship candidates this year are also choosing their graduate schools on the basis of their own needs rather than the prestige of the institution.

The Foundation has named 1,333 students from 381 colleges and universities throughout the United States and Canada as Woodrow Wilson Fellows for 1961-62, the largest number ever elected by the Foundation in its 15-year search for prospective college teachers.

The value of this year's awards is estimated at \$3,000,000.

• Science News Letter, 79:184 March 25, 1961

## SOCIOLOGY

## Victorian Sex Standards Prevail in Russia

► RUSSIAN ATTITUDES toward sex and sexual problems are now almost Victorian in character. This is in sharp contrast to the Soviet sex standards of the 1920's.

No research on the psychology or sociology of sex is being done in Russia today. Soviet educators do not publicly discuss the question of whether young boys and girls should be prepared for puberty. Movies, pictures and books deal with sex in a reserved manner, David Burg reports in The American Behavioral Scientist.

These standards are not resisted by the average Soviet citizen. He does, however, resent their enforcement by the Government. But Soviet authorities say that the social responsibilities of lovers transcend all other obligations, and so infidelity may be regarded as analogous to treason against the State.

There are only two groups in the USSR that openly violate these sexual standards—the stilyagi, or juvenile delinquents, and members of the working class. With the workers the violations are often a result of the housing shortage, which encourages men and women to establish liaisons simply to get a room.

• Science News Letter, 79:184 March 25, 1961



# E FIELDS

## MEDICINE

### Deaths From Abortion Remain High in Britain

► **DEATHS FROM ABORTION** still rank third highest on the list of deaths from maternal causes in England and Wales despite a striking reduction in recent years.

Blood transfusion service and antibiotics are credited with saving many lives, but dextran as a plasma substitute is being discarded because of its negative effect on blood coagulation, Dr. Wilfred S. E. Perera of Walton Hospital, Liverpool, England, reports after studying the treatment of 2,327 abortion cases over a period of two years. Only one died, and he said that it could have been prevented if plasma and not dextran had been used.

Death occurred from uncontrollable hemorrhage because of failure of coagulation, Dr. Perera said. He has now stopped using dextran altogether as a plasma substitute.

"Mortality figures for abortions in general leave no place for complacency," Dr. Perera states.

Because 15% to 20% of pregnancies are estimated to result in abortions, causing a problem in gynecological wards, Walton Hospital more than ten years ago made available a separate ward block with 40 beds as an abortion unit.

Dr. Perera recommended more hospital beds and the establishment of special centers for treatment of abortion to reduce further the general death rate.

His report appears in the *British Medical Journal*, March 11, 1961.

• *Science News Letter*, 79:185 March 25, 1961

## MEDICINE

### Gastrointestinal Allergy May Mimic Appendicitis

► **A BABY'S COLIC** or an adult's stomachache may be due to allergy.

Dr. Orval R. Withers, University of Kansas Medical Center, Kansas City, Mo., told the American College of Allergists' meeting in Dallas, Tex., that allergic patients may have gastrointestinal symptoms simulating gall bladder, ulcer, appendicitis or almost any organic disorder.

Inhalants and antibiotics as well as foods may be at fault, Dr. Withers said, but careful diagnosis is required.

"Gastrointestinal allergies are not common," Dr. Withers said, "but when I see patients who complain of other allergies, such as cause hay fever or asthma, I always investigate stomach and intestinal symptoms."

From the lips to the end of the alimentary canal, gastrointestinal allergies can show themselves, Dr. Withers said.

"A child eating an orange or a woman

wearing a certain type of lipstick may have a swelling of the lips, or angiodermatitis. When recurrent abdominal pain, nausea, diarrhea or heartburn cause distress it may be due to allergy."

What happens is that in stomach or intestinal allergy, the mucous membrane linings contract, the allergist explained. He examines such patients with X-ray or fluoroscope and also with an esophagoscope or gastroscope.

"By using such instruments you can look directly into the stomach and see what the trouble is," he said.

Shellfish, milk, pork and ripe bananas are among the food allergies Dr. Withers has found in his patients.

"A 36-year-old woman patient who really had gallstones was operated upon," he said, "and later when I was treating her for hay fever, we discovered that eating pork had caused recurrence of the pain in the region where the gallbladder had been removed."

• *Science News Letter*, 79:185 March 25, 1961

## PHYSICS

### Underground Nuclear Test Study Planned

► **THE ATOMIC Energy Commission** is considering a program of studies on the earth shock effects of possible underground nuclear detonations.

The studies would be particularly useful in determining the risks involved in the proposed Plowshare Program of atomic detonations for peaceful uses. No nuclear detonation yet has been approved for Plowshare, which has been highly publicized by AEC as a positive reason for continued nuclear testing, at least underground.

Apart from military implications, the AEC has pointed out that the ability to achieve controlled underground explosions could have valuable peaceful uses in the building of dams, canals and other similar major construction. However, the danger of radiation pollution of underground streams, and the very earth itself has kept the Plowshare program in the idea and thought stage only.

The proposed studies also would have an important bearing on the AEC's seismic improvement programs, aimed at increasing basic knowledge of seismology and developing instruments and techniques to improve monitoring of a control system for a nuclear test ban treaty.

To date only five underground nuclear detonations with an explosive yield of one kiloton or more have been fired outside of the Soviet Union, all at the Nevada Test Site. In the study program being considered, existing knowledge of earth shock phenomena associated with such events would be analyzed for use in considering the possible effects of detonations in other geographical regions.

The program also would aid in better predictions than now are possible on earth shock effects on existing structures within a few miles of a detonation.

• *Science News Letter*, 79:185 March 25, 1961

## MATHEMATICS

### Better College Math Training Urged

► **COLLEGE MATHEMATICS** training must be updated to keep abreast of the "explosion" of knowledge in engineering.

A rapid change in the mathematical world and its related fields has made this revision necessary, Dr. H. O. Pollak of Bell Telephone Laboratories stressed to a group of 50 leading mathematicians and engineers meeting in Washington, D. C.

New applications of mathematics in engineering are creating various trends already visible in the engineering world. More emphasis on basic science, installation of large complex engineering systems and wider duties of research engineers demand a stronger mathematics background, Dr. Pollak said.

Extensive changes must be made in the mathematics classrooms, Dr. Pollak said. More mathematics should be required and elementary courses made more "sophisticated" to meet the demand.

The expanding use of engineering mathematics is an "explosive," not a "revolutionary" change, the scientist stated. Already, the electronic computer is affecting every phase of science and technology, from basic research to the production line.

Dr. Pollak spoke to a Mathematical Association of America's committee that is seeking to wipe out the one- to four-century lag in some school and college math teaching.

• *Science News Letter*, 79:185 March 25, 1961

## METEOROLOGY

### Extensive Study of What Causes Tornadoes

► **THE U.S. Weather Bureau** will in the next few months undertake the largest research program ever attempted to study tornadoes and other severe local storms.

The program will be a cooperative effort of various scientific groups to gather more information about the atmosphere when devastating storms break loose.

Secretary of Commerce Luther H. Hodges personally inspected two of the Weather Bureau's "flying laboratories" at the National Airport, Washington, D. C. The two planes, which will be used extensively in the research project, are en route to Oklahoma City, the project's home base.

The planes will again this year be flown straight into the storm centers, collecting valuable information on the little known turbulent areas. Similar methods have been used to track and study hurricanes.

The 1961 research program began March 15 and will end June 1. This is the time of year when twisting tornadoes and slashing severe local storms are at a peak.

The U.S. Weather Bureau is in charge of the National Severe Storms Project. Cooperating agencies include the Federal Aviation Agency, the U.S. Navy and Air Force, and various universities.

• *Science News Letter*, 79:185 March 25, 1961

## ASTRONOMY

# Lion Shines High in South

Leo, the lion, roams the southern sky in April. Gemini, the twins, watch Orion hunting with his dogs, Canis Major and Canis Minor, in the west, James Stokley reports.

► **SHINING HIGH** in the south on April evenings is the constellation of Leo, the lion. Its position is shown on the accompanying maps. These show the appearance of the heavens about 10 p.m., your own kind of standard time, at the beginning of April; an hour earlier in the middle; and two hours earlier as April comes to a close.

The brightest star in Leo is Regulus, which is part of a sub-group called the sickle. The blade of this implement, which is pointed toward the southwestern horizon, forms the head of the lion, as pictured on old star maps. These showed the constellation figures around the stars. Denebola, a second-magnitude star off to the left, marked the tail.

Next to Leo, lower and toward the left, you will see Virgo, the virgin. In it stands the star Spica, which is first magnitude, like Regulus. In the east, and a little higher, is another of this brilliance: Arcturus, in Bootes, the herdsman. (Part of this constellation is shown on the map of the northern sky.)

## Mars Is Only Evening Planet

Look toward the west and you will see the only planet visible these April evenings. This is Mars, which stands in Gemini, the twins.

Since last December, when it came within about 56,000,000 miles of earth, it has been drawing away from us, and now its distance is about 120,000,000 miles. At the same time it has been getting fainter, although it still ranks as first magnitude. Mars is slightly brighter than the star Pollux, just above. By the end of April, however, it will become fainter than Pollux, and by summer it will have faded to the second magnitude of celestial brightness.

Lower than the Gemini, in the western sky, are some of the constellations that shone so brilliantly high in the south on midwinter evenings. There is Canis Minor, the lesser dog, with Procyon; below, near the horizon, is the big dog, Canis Major, with Sirius. To the right of this group is Orion, the warrior, partly below the horizon. However, the bright star Betelgeuse is still visible. And farther to the right (shown on the map of the northern sky) is Taurus, the bull, with Aldebaran, shown fainter than its customary first magnitude, because it is so low. In this position, much of its light is absorbed by the earth's atmosphere. And to the right of Taurus, you will find Auriga, the charioteer, with Capella.

The familiar "Big Dipper," which is part of Ursa Major, the great bear, shines high in the north. The pointers are aimed downward, toward Polaris, the pole star, in the

"Little Dipper" and also in Ursa Minor, the lesser bear. Winding its sinuous length between the two dippers is the fainter constellation of Draco, the dragon.

In recent months the planet Venus has been shining in the western evening sky, more brilliant than any other star or planet. On April 10, it comes between sun and earth, and will not be visible. After that it will move across the sky ahead of the sun, rising before sunrise. In another month or so it will be visible in the east at dawn, just as prominent as it has been recently in the west at twilight. Jupiter is also a morning star, shining in the southeast for a few hours before the sun appears. Saturn, considerably fainter, is near it.

Venus and Mercury (which is not visible at all in April) are the only two planets nearer to the sun than earth. Our average distance is about 93,000,000 miles, while that of Venus is about 67,000,000. We go around the sun in 365 days, Venus in 225 days.

The last time that Venus came between earth and sun, reaching the position called "inferior conjunction," was on Sept. 1, 1959. By last April it had completed a full circuit of its orbit around the sun, but the earth was in another direction from the sun. By last November Venus had made one more

such circuit but still had not caught up to earth again, as it will on April 10.

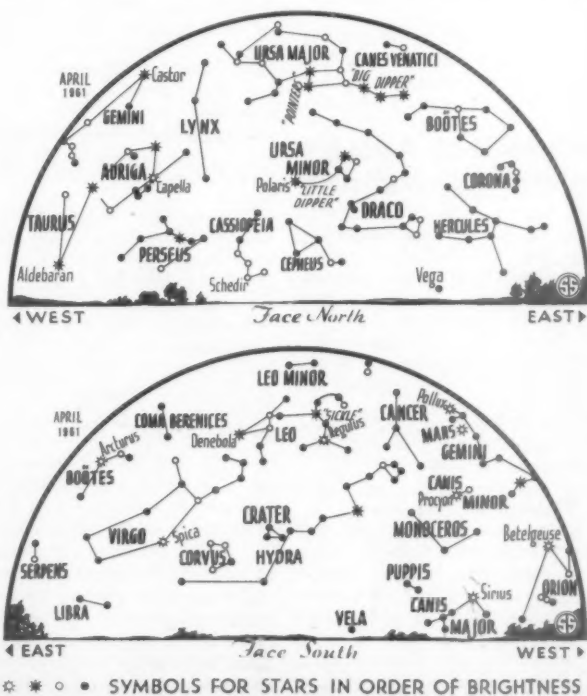
When Venus is on the far side of the sun, at the position called "superior conjunction," its distance is about 160,000,000 miles, which is the sum of its distance from the sun and ours. But at inferior conjunction when it comes closest, it is only about 26,000,000 miles away (67,000,000 subtracted from 93,000,000). No other planet comes as close, but since it is in line with the sun it cannot be observed at this close approach.

## Probe Sent at Best Time

It is, of course, because of its present proximity that the Russian space scientists chose this spring to fire their Venus probe, which is now speeding toward that planet.

Many people are wondering whether the space vehicle will actually hit Venus, as the moon was hit with the Lunik rocket. But the moon is less than a quarter of a million miles away, and it is far more difficult to hit Venus at 26,000,000 miles. It would take highly accurate guidance to get the probe there. If it misses the planet by just a little, it will be pulled by the Venus gravitational field into an orbit around that body. In other words, it will become a satellite of Venus. With a miss at a greater distance, its path will be affected, but it will go on, to become an artificial planet, like Mecha and Pioneer V, continually encircling the sun.

The probe is evidently equipped with in-



☆ \* • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

struments to gather data about Venus, for example, the magnetic field, and the radiation of heat from the planet. Even at a distance of a few hundred thousand miles, far more accurate results could be obtained than can be determined from earth. The readings of these instruments will be sent back by radio. But just as the glare of the sun prevents observations of Venus visually at the time of inferior conjunction, so also might there be some interference with radio transmission.

The sun itself sends out radio waves, and with the probe in the same direction as the sun, they might interfere with the transmissions giving data about Venus. Perhaps, however, the probe will be able to store the data, and transmit the information later, when the sun is not in quite the same direction. Then radio telescopes could be pointed to the probe, and could pick up its message more easily. Or if, as originally announced by the Russians, the probe reached Venus in May, which would be about a month after the closest approach, the added distance would not be serious, and again there would be less interference.

In any event, this April astronomers all over the world are awaiting with interest what news of Venus the Soviet probe may tell.

## Celestial Time Table for April

April	EST	
1	12:48 a.m.	Full moon
5	5:16 a.m.	Moon in last quarter
9	1:00 a.m.	Moon passes Saturn
	9:00 a.m.	Moon passes Jupiter
10	7:00 p.m.	Venus at inferior conjunction (i.e., between sun and earth)
11	3:00 a.m.	Moon nearest, distance 228,600 miles
15	12:38 a.m.	New moon
17	8:00 p.m.	Mercury passes Venus
21	Midnight	Moon passes Mars
22	4:50 p.m.	Moon at first quarter
23	5:00 a.m.	Moon farthest, distance 251,100 miles
30	8:00 a.m.	Neptune (planet not visible to the naked eye) nearest earth, distance 2,724,000,000 miles
	1:41 p.m.	Full moon

Subtract one hour for CST, two hours for MST, and three hours for PST

• Science News Letter, 79:186 March 25, 1961

## ROCKETS AND MISSILES

## Russian Venus Vehicle Halfway by April 3

### See Front Cover

► THE SOVIET space vehicle sent to probe the secrets of Venus, the mystery planet, is scheduled to be about halfway on April 3.

At that time, the space vehicle, launched Feb. 12, will be about 13,000,000 miles from earth. Radio contact, lost for a while, has again been established with the vehicle that is expected to be in the vicinity of the planet some time in May.

The front view of the Venus vehicle, seen on the cover of this week's *SCIENCE NEWS LETTER*, shows the two banks of solar batteries and the blinds of the thermal control system. The rod antenna in this view is half opened.

• Science News Letter, 79:187 March 25, 1961

GET READY FOR THE SPACE and SCIENCE ERA! SEE SATELLITES, MOON ROCKETS CLOSE-UP

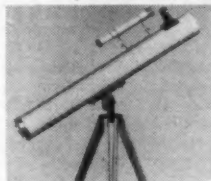


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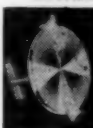


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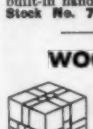
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**BIRD MORTALITY IN THE DUTCH ELM DISEASE PROGRAM IN MICHIGAN**—George J. Wallace, Walter P. Nickell and Richard F. Bernard—*Cranbrook Inst. of Science*, 44 p., paper, \$1. Survey of bird losses observed in Michigan in connection with elm disease control programs.

**BOTANICAL BULLETIN OF ACADEMIA SINICA**,

**New Series, Vol. 1, No. 2**—H. W. Li, Dir.—*Institute of Botany, Academia Sinica, Taiwan*, 175 p., photographs, paper, annual subscription \$2. Publishes original Chinese research in botany, in English, continuing on Taiwan the Old Series begun in March 1947 in Shanghai by this Institute.

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**FREEDOM AND COMMUNICATIONS**—Dan Lacy—*Univ. of Ill. Press*, 93 p., \$3. Appraisal of U. S. communications system of the 1950's—books, newspapers, magazines, radio, television and libraries.

**GALILEO IN CHINA: Relations through the Roman College between Galileo and the Jesuit Scientist-Missionaries**—Pasquale M. D'Elia, transl. by Rufus Suter and Matthew Sciascia, foreword

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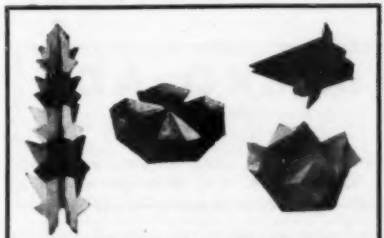
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## Books of the Week

(Continued from p. 188)

—D. W. G. Arthur and E. A. Whitaker; Gerard P. Kuiper, Ed.—*Univ. of Arizona Press*, 18"x 23", 34 sheets in loose-leaf binder, \$9. Sectionalized, high-precision maps of moon's central regions for use at telescope or in classroom.

OUR NATIONAL PARK POLICY: A Critical History—John Ise—*Johns Hopkins Press*, 701 p., illus., \$10. Covers mainly the scenic and archaeological parks and monuments, gives some attention to forest and grazing lands and the general problems of conservation.

THE OUTERMOST HOUSE: A Year of Life on the Great Beach of Cape Cod—Henry Beston—*Viking*, 222 p., paper, \$1.25. Reprint of story about the seasons on a beach at the North Atlantic.

THE PEOPLE OF ALOR: A Social-Psychological Study of an East Indian Island, Vol. I—Cora Du Bois, with analyses by Abram Kardiner and Emil Oberholzer—*Harvard Univ. Press*, 654 p., illus., \$10. Reissue of classic work in modern anthropology, with author's new chapter "Two Decades Later."

PLANT ANALYSIS AND FERTILIZER PROBLEMS—Walter Reuther, Ed.—*AIBS*, 454 p., \$8. Papers and discussions of the Third Colloquium, held in Montreal, Canada, in August, 1959, in connection with the 9th International Botanical Congress.

PROBLEMS OF THE NORTH: Translation of "Problemy Severa"—P. A. Gordinenko and others—*National Research Council, Canada*, 376 p., illus., paper, \$7. Collection of papers by Russian specialists on oceanographic, geological, geographical and biological aspects of polar regions.

PROFESSOR: Problems and Rewards in College Teaching—Fred B. Millett—*Macmillan*, 189 p., \$3.50. Book traces the full span of a teaching career.

PROGRESS IN ENDOCRINOLOGY, Part I: Neuroendocrinology and Endocrinology of the Thyroid and Parathyroid Glands—K. Fotherby and others, Eds.—*Cambridge Univ. Press*, 166 p.,

illus., \$8.50. Proceedings of the Edinburgh meeting on Endocrinology, 16-20 August, 1959.

RADIO ASTRONOMY—F. Graham Smith—*Penguin*, 265 p., illus., paper, \$1.65. Reviews the origin, development and achievements of radio astronomy, for the layman.

RUSSIAN FOR SCIENTISTS—Dennis Ward—*Macmillan*, 204 p., \$3.95. Introduction to Russian grammar, provides a recognition course aimed at helping student to recognize grammatical forms in Russian text.

SENSORY DEPRIVATION: A Symposium Held at Harvard Medical School—Philip Solomon and others, Eds., foreword by Stanley Cobb—*Harvard Univ. Press*, 262 p., \$5.75. Papers and discussions of experimental and clinical studies, theory and implications.

SEPARATION PROCESSES IN PRACTICE—Robert F. Chapman, Ed.—*Reinhold*, 209 p., illus., \$4.95. Practical information for the young chemical engineer.

SIMPLIFIED CALCULUS—F. L. Westwater—*Macmillan*, 160 p., \$3.50. Emphasizes the essentials of calculus as well as underlying basic mathematical principles, and presents symbols in clearly defined stages.

SOCIOLOGY OF CRIME—Joseph S. Roucek, Ed.—*Philosophical Lib.*, 551 p., \$10. Contributions by sociologists, psychiatrists, law enforcement personnel and educators.

THE SPLIT-LEVEL TRAP—Richard E. and Katherine K. Gordon with Max Gunther—*Gris (Random House)*, 348 p., \$4.95. Psychiatrist and his wife look at suburban living.

THE STRUCTURE OF SCIENCE: Problems in the Logic of Scientific Explanation—Ernest Nagel—*Harcourt*, 618 p., \$10. Scholarly investigation of the limits and possibilities of sciences, what they can and cannot answer about the "why" of things, of human behavior, of events.

A SURVEY OF PHYSICAL THEORY (Formerly Titled: A Survey of Physics)—Max Planck, transl. by R. Jones and D. H. Williams—*Dover*, 117 p., paper, \$1.15. Collection of essays and papers first published in 1925.

A SYMPOSIUM ON LIGHT AND LIFE—William D. McElroy and Bentley Glass, Eds.—*Johns Hopkins Press*, 924 p., illus., \$15. Contains papers and informal discussions on molecular structure and excited states, photosynthesis, and biological reactions to light.

THINKING AND PSYCHOTHERAPY: An Inquiry into the Processes of Communication—Harley C. Shands, foreword by Stanley Cobb—*Harvard Univ. Press*, 319 p., \$5.75. Psychiatrist aims at synthesis of leading ideas in neurophysiology, the psychology of language and thought, sociology and psychotherapy.

VACUUM MICROBALANCE TECHNIQUES, Vol. I—M. J. Katz, Ed., introd. by Thor N. Rhodin—*Plenum Press*, 152 p., illus., \$6.50. Proceedings of 1960 Conference sponsored by U. S. Army Signal Research and Development Laboratory.

WHY CAN'T YOU HAVE A BABY?—Alan F. Guttmacher and Joan Gould—*Public Affairs Committee*, Pamphlet No. 309, 20 p., illus., paper, 25¢ direct to publisher, 22 E. 38th St., New York 16, N. Y. Gynecologist discusses the question of fertility.

THE WILD BLUE: The Story of American Airpower—John F. Loosbrock and Richard M. Skinner, Eds.—*Putnam*, 620 p., \$5.95. Selection of articles that appeared in *Air Force Magazine*, 1946 through 1960.

A WORLD WITHOUT WAR—Walter Millis—*Center for the Study of Democratic Institutions*, 72 p., paper, single copies free upon request direct to publisher, Box 4068, Santa Barbara, Calif. Paper followed by discussion of the viability of a warless world.

• Science News Letter, 79:188 March 23, 1961

## MICRO-ADS

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NATIONAL GEOGRAPHIC MAGAZINES, 1888-1960, any issue. Periodical Service, Box 465-SN, Wilmington, Delaware.

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## INVENTION

## Safety System Invented For Nuclear Reactors

► A SAFETY SYSTEM has been invented that prevents a nuclear reactor from shutting down when the power source fails. The nuclear reactor is switched over to a stand-by power supply by a safety device patented.

Costly shutdowns of nuclear reactors due to power failure are unnecessary, inventor Anthony E. T. Nye of Clifton, England, claimed. His safety system supposedly discriminates between critical reactor faults, which definitely warrant a shutdown to prevent accidents, and a power supply fault.

The safety system consists of a shutdown relay and at least one control relay. Alternating current is sent through the shutdown relay to the nuclear reactor's control rods during normal operations. If anything critical happens, the relay would automatically cut off the power supply, shutting the reactor down.

The control relay acts similarly except that it has two relays instead of one. In case of power failure, one of the relay contacts would have a "delayed release time" long enough to permit a change of power supply.

The invention underlines the recent concern about the safety of nuclear reactors in the United States. Three persons were killed recently near Idaho Falls, Idaho, in a nuclear reactor accident.

The patent rights of the invention, patent No. 2,973,458, were assigned to the British Thomson-Houston Company Limited of London, England.

• Science News Letter, 79:191 March 25, 1961

## INVENTION

## Develop Control System For Space Vehicles

A control system for keeping space vehicles on course can be used to absorb any tendency of a space vehicle to stray off its course in space, Dr. Walter Hausermann of the Marshall Space Flight Center at Huntsville, Ala., states.

A flywheel housed in the satellite controls the satellite's bearing by the speed it rotates. The flywheel is powered by a motor whose source of energy is solar cells.

Any change in the desired bearing is

## Do You Know

The island of *Tasmania*, off the Australian coast, was named after its Dutch discoverer, Abel Tasman.

Fire losses in the United States totaled \$1,107,824,000 in 1960, an all time record.

One species of *weaverbirds* builds "apartment house" nests of matted grass that house as many as 100 bird families under the same roof.

• Science News Letter, 79:191 March 25, 1961

registered by a computer that sends a danger signal to the device controlling the current supplied to the motor. The speed of the flywheel is then changed to offset the outside force.

The invention is also equipped to stem flight deviations resulting when the space vehicle is blasted off its launching pad, according to patent No. 2,973,162.

• Science News Letter, 79:191 March 25, 1961

## MEDICINE

## Foot Clinics Advised For Diabetic Patients

► BECAUSE OF foot complications in diabetic cases, hospitals are beginning to put podiatrists on their staffs and open foot clinics.

Dr. Edward L. Tarara, podiatrist at the Mayo Clinic, Rochester, Minn., told physicians at the Georgetown Hospital diabetes symposium in Washington, D. C., that ulceration and gangrene occurrence can be reduced by knowledge of proper foot care.

"There is a definite reduction in amputations when podiatrists look after the diabetic patient's feet," Dr. Tarara said. "The complicating problems of neuropathies (nerve diseases), arteriosclerosis, etc., are manifested primarily in the lower extremity."

Neuritis is a common diabetic complication, he said, and certain lesions of the toes and feet of diabetics result from it. A podiatrist sees foot complications resulting from a simple irritation of a corn to a painful ulceration that, if untreated, may terminate with loss of all or part of the foot or leg, or even in death.

Basic rules for care of the feet of a diabetic are:

Keep the feet clean. Avoid bruises and cuts, giving proper attention to toenails, corns, calluses, shoes and stockings. Avoid burning or freezing the feet and avoid using strong antiseptics. Avoid constricting the circulation. Provide rest for injured feet. Make use of measures to improve the circulation.

Dr. Tarara said that if a diabetic keeps his feet as clean as his hands and face, gangrene and infections seldom occur.

• Science News Letter, 79:191 March 25, 1961

## Questions

**MEDICINE**—What is sulfate salt of Vinblastine? p. 181.

**PHYSICS**—How many underground nuclear detonations with an explosive yield of one kiloton or more have been fired outside the USSR? p. 185.

**ROCKETS AND MISSILES**—How far into space is the P-14 space probe scheduled to travel? p. 179.

**Photographs:** Cover, Press Dept., USSR Embassy; p. 179, left, Hughes Aircraft Company, right U. S. Navy; p. 181, General Motors Research Laboratories; p. 183, Pollak and Skan, Inc.; p. 192, Bradford's.



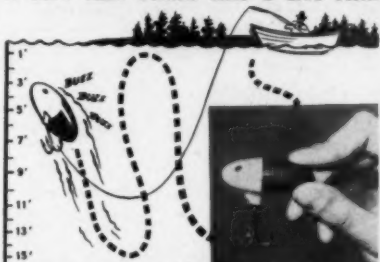
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• Science News Letter, 79:192 March 25, 1961

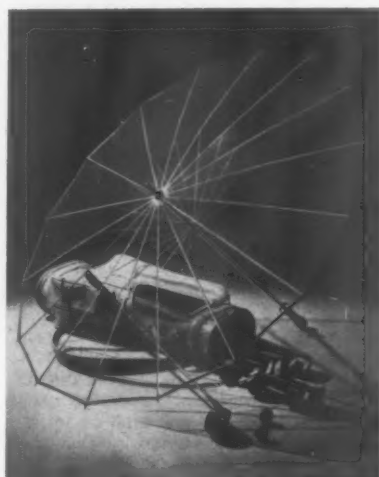
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• Science News Letter, 79:192 March 25, 1961

✿ **ILLUMINATED HOUSE NUMBERS** may be attached on any house bell circuit, 6 to 24 volt AC or DC. Anodized aluminum-framed unit in bronze or silver has adjustment for brightness of lamp. Black, rubber-impregnated numerals may be read day or night from a distance of 200 feet.

• Science News Letter, 79:192 March 25, 1961

✿ **GOLF UMBRELLA** of crystal-clear, heavy gauge plastic provides a clear view down the fairway in drizzle or downpour.



It is more than four feet wide when open. During rainy football games, the umbrella, shown in the photograph, keeps three persons dry. It is also useful for gardeners, fishermen and other sports fans.

• Science News Letter, 79:192 March 25, 1961

✿ **PORTABLE PROJECTOR** with a screen and high-fidelity playback unit built into a single compact case opens in seconds

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• Science News Letter, 79:192 March 25, 1961

✿ **THREADON TROLLER** is a new rig, used in trolling for all game fish, on which bait will stay alive and in a natural position for a long time. The nickel-plated troller is said to assure positive hooking when fish strike.

• Science News Letter, 79:192 March 25, 1961

✿ **TRANSMITTER** no larger than a pack of cigarettes for use with any home, car or portable radio provides close-range communication for practical applications. Certified by manufacturer to meet FCC requirements for low-powered transmitters, unit does not require an operator's license for use.

• Science News Letter, 79:192 March 25, 1961

✿ **BLOW TORCH** for "do-it-yourself" home soldering is powered by air blown into small plastic tube by user. Torch unit comes complete with a two-hour replaceable fuel supply of 12 fuel tablets. Miniature torch is operated by placing a tablet on a special metal holder, focusing small air nozzle, igniting tablet, and gently blowing air through tube connected to nozzle.

• Science News Letter, 79:192 March 25, 1961



## Nature Ramblings



► **AFTER WINTER'S QUIET**, the first "ker-lunk" of the courting frog at the beginning of spring is as welcome as the flute of the brown thrush.

One of the evidences of the balance established in nature is that the frog does not sing like a brown thrush. If it did, there would be unending confusion among frogs and thrushes, for the frog song, like the thrush song, is an amatory performance.

"Indeed, it is even more of a serenade than the thrush song, for male birds sing at least partly for the same reason that a rooster crows, that is, to warn interlopers and rivals off the reservation. By contrast, the frog, so far as is known, is solely bent on wooing his coy mate.

There is something abysmally human about his method: he gets so puffed up over it. He swallows all the air he can hold, blows out the skin under his throat into a tight little balloon, sometimes half as big as himself, and puts his whole heart into a flat

### Courting Frog



note. Sometimes he gets so interested in his own singing that he forgets all about the lady, so that she has to come up and nudge him gently, to remind him that after all, the opera is supposed to have something to do with her presence.

The frog and toads form a natural group of amphibians. The terms "frog" and "toad" are often used loosely; however, frog generally refers to the forms that live in the

water most of the time while those living mostly on land are called toads.

The order of these amphibians is divided into eight families. One family of frogs, Ascaphidae, of which there is only one kind in this country, has short ribs, smooth skin and the males have short tails.

The tree frogs belong to the family Hylidae that are mostly small, slender frogs with toes that expand at the tips to aid the animal in climbing.

The Leptodactylidae are called "robber frogs." The family Ranidae is that of so-called true frogs and includes the well-known bullfrog, living in water.

It is mostly the male frogs that call, and their voice is especially loud in the spring during the mating season.

The female frogs have no mating song. They are only able to call in a low, subdued voice.

• Science News Letter, 79:192 March 25, 1961

